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CROP WATCH

University of Nebraska Cooperative Extension
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Most Nebraska soils cold and dry

Most of the major U.S. hard red winter wheat region lacks suffi-cient soil moisture for this growing season. This includes the Panhandle and southern Nebraska, all but southeast Kansas, western Oklahoma and the Texas Panhandle.

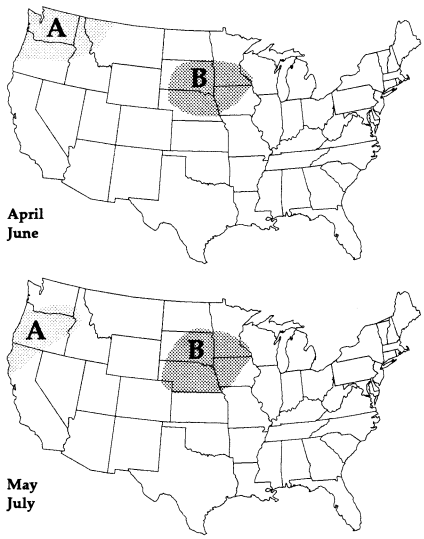
Precipitation records indicate this was the driest October through February in a century, and the driest February in Nebraska since official records began in 1875.

Models show that across the southern two-thirds of Nebraska, soils have held just 1-4 inches of moisture since last October. Most of this moisture in in the top foot of the profile. Soils in this region typically hold 6-15 inches in a 6-foot profile. Soil moisture is basically nonexistent at 2-5 feet.

As bad as soil moisture reserves are across southern Nebraska, the extreme northern Sandhills and northeast Nebraska have adequate moisture. Some producers are even waiting for the top soil to dry further before beginning tillage in northeast Nebraska.

The storm systems crossing Nebraska March 24 and 30 produced moderate precipitation across the eastern quarter of the state. Most of the precipitation was probably absorbed by the soil. The cold weather that accompanied these storms has lowered soil temperatures into the mid 30s to low 40s across the state. A week of temperatures in the 60s and 70s with nighttime lows in the 40s should bring soil temperatures back to normal.

Al Dutcher
State Climatologist
Agricultural Meteorology



A = Above normal precipitation
B= Below normal precipitation

Inside

Coming soon

- Wheat crop update
- Production strategies for a dry year
- Alternative crops

Prepare for drought — increase fertilizer efficiency

Many areas of Nebraska are dry and precipitation predictions are not encouraging for extensive rains. Especially under these conditions, it's important to understand the relationship between adequate plant nutrition and water use efficiency.

As a rule, any improvement that increases yields will increase water use efficiency, and many factors associated with improved yields do not increase total plant water use. Yields can be increased by making the same water quantity produce a larger yield. Some of the factors affecting water use include tillage, pest management, cultural practices and nutrient management. Water use efficiency — defined as the number of units of dry matter production per unit of water — is usually expressed as bushels or tons per inch of rainfall. Plants need an adequate nutrient supply for roots to grow and fully explore soil resources. In dry years, deeply rooted crops have a larger soil volume from which to

(Continued on page 26)

Fertilizer efficiency (Continued from page 25)

extract water and nutrients. Roots which do not extend very deep can contribute to decreased yields in dry years. Compaction and root-feeding insects can stop roots from penetrating a large volume of soil. In addition, a moist surface soil in the early season may not force roots to go deep. If conditions turn dry, the roots will not be able to use subsoil moisture later.

Under drought conditions, nutrient deficiencies may occur because roots are not as extensive and may not absorb nutrients as effectively. In addition, when soil moisture is reduced, nutrients may move more slowly in the soil, decreasing the probability of roots absorbing adequate amounts. Once a nutrient deficiency begins, plant cell functions slow, resulting in a potential increase in water loss through increased transpiration. Slower growth lengthens the time to canopy closure which increases evaporation from the soil surface resulting in drought stress.

Nutrient deficiencies will increase time to maturity. Adequate nutrient supply early in the season may allow crops to pollinate before extreme heat and reach physiological maturity before an early frost.

To preserve moisture in dry years, maintain plant residues on the soil surface as long as possible to catch and keep moisture from running off or evaporating. Stay off wet soils to avoid compaction. Generally, high nitrogen rates do not make up for poor root growth. Last year tests in northeast Nebraska found that root growth was inhibited due to compaction from planting in wet soils. Treatments with higher nitrogen rates did yield better.

To improve the efficiency of your fertility program, take deep soil samples to discover fields with carry-over nitrogen and characterize soil moisture in the subsoil. Since last year was dry, many fields with lower than expected yields may have considerable carry-over soil nitrates. If the subsoil moisture status is known, spring rains can be measured and soil moisture in the soil profile at planting can be calculated at planting.

Plant roots will not grow in dry soil, so nitrates found in dry soil will not provide nutrition for the crop until soil moisture is improved. For phosphorus, band apply nutrients and avoid broadcast applications since corn roots will not use phosphorus from the soil unless there is adequate mulch to maintain moisture. When placing nutrients in a starter band, put nutrients close to the seedling early in the season. Under dry conditions placing nutrients deeper and in moisture may increase effectiveness.

Yields under dry conditions will not reach comparable yields as in wet years, but through proper cultural and fertility practices yields can be maximized.

Charles Shapiro, Soil Scientist -- Crop Nutrition, Northeast Research and Extension Center

Baythroid registered for alfalfa, sweet corn

Baythroid 2 has received federal registration for use on alfalfa, sunflowers, and sweet corn.

According to Bayer, manufacturer of this insecticide, Baythroid 2 provides: wide spectrum effective control and rapid knockdown of target pests; long residual control; low mammalian and bird toxicity; and no posting requirements with a 12-hour re-entry. It is classified as a "restricted use" insecticide.

Shripat T. Kamble, Extension Specialist, Pesticide Assessment

CROPWATCH

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Save tillage for specific solutions

Some producers who have started their spring tillage report that the soil is "working well" because it is fairly dry. There are several reasons for tillage, but with concerns about tight profit margins, soil moisture conservation, and erosion control, producers must question why they are doing each tillage operation they perform.

In many cases, the decision for tillage is based more on tradition than actual need. There are four basic reasons for tillage: incorporation, weed control, leveling, and compaction. Seed bed preparation is not on the list because today's planters and drills can do the "tillage" necessary for planting. Tillage makes a seed bed across the full width and "plants" surface weed seeds and volunteer crops.

Some producers are in the field just because it is dry enough to till, unlike last year's wet spring. Unfortunately, this tillage is fluffing the soil and drying it out even more, roughly to the depth of tillage. In wet years, producers report doing tillage to dry out the soil, in many cases an inappropriate goal this year. The second reason for tillage is to incorporate non-mobile nutrients or herbicides. However, this same incorporation reduces the amount of residue cover, increasing the potential for erosion and decreasing the mulch that reduces evaporation. In addition, a tilled soil without the protection of residue cover crusts easily when it does rain, decreasing infiltration and increasing runoff. To get all the benefits of the residue, consider tillage alternatives such as properly timed herbicide applications and injection of nutrients. Rainfall can incorporate surface applied herbicides more uniformly than tillage. Nitrogen can be incorporated by rainfall or injected into the soil to minimize losses. Phosphorous can be placed as starter fertilizer with the planting equipment, further reducing the need for tillage. The planter, often without attachments, can handle the residue in no-till without tillage burying the residue, planting the weed seeds, and drying the soil.

Conrol weeds to save soil moisture, especially in a dry year. If weeds are large, tillage may be an economical method of broad spectrum weed control. However, at this time of year, few weeds are present. An early preplant application of residual herbicides will prevent many weeds from getting started or a properly timed burndown or postemergence application on growing weeds will reduce soil moisture losses. Early season tillage usually doesn't control weeds, but rather plants weed seeds. This ends up costing money because it lets the weeds get a head start on the crop. In this case, either another tillage trip which dries the soil more or a herbicide application is needed to control the weeds. Applying residual herbicides with a one-pass tillage system reduces these problems, but must be timed properly to have both early preplant and season-long weed control.

Tillage also can be used to level a field or fill in ditches. However, unless something is done to protect the soil, the ditches will usually wash out again. Time tillage so that residue or vegetation can be used to reduce erosion. Control runoff to stabilize the soil and reduce the washing.

A compacted soil can be loosened with tillage when it is dry. Even though the soil is dry now, deep tillage should not be used to reduce compaction because it tends to dry out the soil. The best way to reduce the need to till soil to get rid of compaction is to not till the soil when it is wet. If there is root limiting compaction, this tillage should be done in a dry fall when the fracturing is more effective. Deeper tillage in the spring on wet soils creates compaction or smears the soil, causing sealing.

Paul Jasa
Extension Engineer

Weed control key to no-till

Successful no-till crop production requires that weeds established prior to planting, and weeds that emerge later, be controlled. The following strategies will help you effectively control weeds under a no-till crop production system.

The Early Preplant Strategy

Preplant treatments can be applied 5 to 10 days before planting corn and 20 to 30 days before sorghum and soybeans. A preplant herbicide application, which includes both a grass and broadleaf herbicide, will normally provide season-long weed control in corn. However, an additional herbicide treatment may be needed at planting if the initial application is 20 to 30 days ahead of planting as in sorghum and soybeans, or if the soil is disturbed significantly during planting.

Early weed growth can be controlled successfully by applying an early preplant (EPP) herbicide. Ideally, an EPP herbicide is applied before weed seeds germinate. Most EPP treatments include a triazine herbicide, such as Atrazine, Bladex, Lexone or Sencor, which control small emerged broadleaf weeds and many grasses less than 1" tall. This effect can be increased by adding either 2,4-D, crop oil concentrate, or 28% UAN solutions. If the grasses are taller than one inch, include Roundup or Gramoxone Super.

(Continued on page 28)

Windbreaks cut erosion, enhance crop productivity

With a dry growing season looming in the near future, many producers are reminded of previous periods when wind erosion was a serious problem. If you are fortunate enough to have a good field windbreak in place you can rest a little easier knowing that your soil is protected from the wind. Unfortunately less than 2% of Nebraska's crop acres are protected by field windbreaks.

Field windbreaks reduce wind speed by about 50% in the area immediately behind the windbreak. This wind protection extends into the field for a distance equal to 10 to 15 times the height of the windbreak. A smaller area in front of the windbreak is also protected. This area extends into the field for a distance equal to two to five times the windbreak height. For example, a 30-foot-tall pine windbreak will protect two areas, a large area extending 300 to 450 feet down wind of the windbreak and a smaller area extending 60 to 150 feet in front of the windbreak. Within these areas wind erosion is reduced or eliminated.

Fine soil particles contain most of the humus and nutrients in the soil. They move easily in the wind and if lost, soil fertility is reduced. Normally, soil particles do not move until the wind speed is above 12 miles per hour one foot above the ground. In most situations, wind speeds in fields protected by windbreaks are reduced below the level necessary to move soil. A combination of field windbreaks and conservation tillage provides producers additional soil protection, flexibility and benefits

(Continued on page 29)

No-till weed control *(Continued from page 27)*

No-till planters equipped with certain coulters disturb the herbicide barrier in the row, which can result in "weed escapes." In this situation, apply either a pre-emergence or postemergence herbicide over the row.

The early preplant strategy has several advantages. Because weeds are not established, early season weed control is usually more consistent, soil moisture is conserved, and the expense of the burndown herbicide is eliminated. The main disadvantage is that these applications will fail if rainfall does not activate them. Also, if planting is delayed because of excessive rainfall, the herbicide may dissipate, shortening the period of weed control. For late planted crops, including sorghum and soybeans, sequential herbicide treatments are usually needed to maintain season-long control.

Early preplant plus pre-emergence or postemergence strategy

Soybean and grain sorghum planting usually follow corn by 10 to 30 days. Early preplant treatments in these crops are usually applied 20 to 40 days before planting. A single early preplant herbicide application may not provide season-long control.

A split application, with one portion of the herbicide (1/2-2/3 of full rate) applied early preplant and the balance applied later, helps maintain control. Another strategy is to apply an early preplant treatment and follow up with a postemergence herbicide program. Not only are the operations spread out over an extended period, but you can choose the herbicide to match the weed problem. Split or sequential applications often provide the most consistent weed control in soybeans.

Planting time strategy

A pre-emergence herbicide is applied in combination with a nonselective, foliar applied herbicide, such as Gramoxone Super or Roundup. The nonselective herbicide controls established weeds and the residual herbicides provide weed control for the rest of the season. With corn that is planted before weeds become well established, Gramoxone or Roundup are usually not required.

The advantage of planting time treatments is that a single herbicide application controls the weeds. The disadvantages are the added cost of the "burndown" herbicide, where needed, erratic weed control if the weeds are excessively tall or dry weather follows application, and depleted soil moisture if weed growth develops.

Burndown + postemergence strategy

Another approach using only postemergence herbicides involves a burndown treatment up to five days before planting followed by a postemergence treatment(s). The burndown treatment should be applied prior to planting sorghum and soybeans. Weed growth prior to corn planting is often minimal.

Economical preplant broadleaf weed control without tillage is available with 2,4-D and Banvel. The time saving of eliminating tillage may be an important consideration. Crop safety may require a delay in planting after treatment. Corn on fine textured soils can be planted seven days after an application of 1 pt. 2,4-D ester (4 lb/gal) or 1/2 pint Banvel per acre. Sorghum is more sensitive than corn and planting should be delayed 7-10 days after the same treatments. Soybeans can be planted seven days after an application of 1 pint/A 2,4-D[e]. Banvel should not be used prior to soybean planting.

John McNamara
Extension Assistant
Weed Science
Alex Martin
Extension Weeds Specialist

Control dandelions early; save soil moisture

Moisture-stealing dandelions are moving into farm fields in some parts of the state. The common dandelion is a perennial herb whose branched taproot can extend for several feet, extracting valuable subsoil moisture. It reproduces by seeds and by new shoots from the root crowns. Leaves, 2 to 12 inches long, are clustered at the top of the root crown.

The dandelion grows in moist soils, including lawns, meadows, pastures and overgrazed areas. It is good forage on the ranges, and is especially relished by sheep and cattle. Flowering occurs almost nine months of the year in temperate climates.

Dandelions are increasing in ridge plant and no-till fields. To control dandelion in a corn field, apply a herbicide in the fall or spring. Dandelions remain active late in the fall and begin growth early in the spring much like rosettes of musk thistle or curled dock. Products and rates to use are:

- 2,4-D LV ester at 1.0-1.5 qt/A*
- Banvel at 1.0 pint/A
- Roundup at 3.0 qt/A
- 2,4-D + Banvel at 1.0 qt + 0.5 pt/A*
- 2,4-D + Roundup at 1.0 pt + 1.0 pt/A*

**Assuming 2,4-D is a 4 lb/gal formulation*

It's important to achieve good coverage of the dandelion rosettes. Normally these products will be effective when daytime temperatures are in the 50s or higher; however, effectiveness depends more on the weed's metabolic activity than on air temperature. Dandelion is a cool-season plant and its low growth keeps the rosette active when the soil is warm, similar to musk thistle.

The rates of Banvel and 2,4-D needed to kill dandelions are too risky to use at planting, so apply these rates at least two weeks before planting corn or after corn emergence. Do not apply Banvel in a field to be planted to soybean. There is a 30-day waiting period prior to planting soybean when 1 qt of 2,4-D is used. At lower rates, these herbicides will be less effective on dandelion. Roundup is non-selective, so apply it before crop emergence. All of these herbicides are translocated and slow-acting, so be patient.

Contact herbicides such as atrazine, metribuzin, or Pursuit will not kill established perennial plants, but they can control seedlings. Mixing contact herbicides with translocated herbicides sometimes reduces overall effectiveness because a contact herbicide rapidly disrupts the plant tissue before

translocation is complete. Contact herbicides with soil activity can provide residual seedling control and root uptake for a sustained effect; however, a translocated, foliar-applied herbicide will be needed for perennial plant control because the crown buds have to be killed for total effectiveness.

For cost effectiveness, 2,4-D is difficult to beat; however, the added presence of curled dock, Canada thistle, and other cool season weeds may call for combining products. For example, 2,4-D is weak on curled dock but 2,4-D + Banvel will be effective on both species.

Fred Roeth
Extension Weed Specialist

Windbreaks *(Continued from page 28)*

not available when either practice is used alone.

Blowing soil can cause abrasion to new crop seedlings. In severe cases, whole fields may need to be replanted due to damage caused by soil abrasion. While most small grains, corn and sorghum are moderately tolerant to damage caused by wind blown soil, other crops, such as soybeans, new alfalfa stands and all vegetables have a very low tolerance to wind blown soil and are easily damaged. Windbreaks provide protection and reduce damage caused by wind blown soil during these early growth stages.

Field windbreaks reduce evaporation and conserve soil moisture for germinating crops. They reduce desiccation damage to seedlings and lead to improved crop stands and ultimately better yields. Studies in Nebraska have shown increased yields for winter wheat (about 15%), corn (about 12%) and soybeans (about 15%) as a result of wind protection by field windbreaks.

It's not too late too consider planting a field windbreak this spring, but time is short. Sales of conservation trees will continue for a few more weeks. If you are interested in more information about windbreaks to protect your operation, contact the District Forester at the UNL Research and Extension Center nearest you.

Jim Brandle
Shelterbelt Ecologist
Forestry, Fisheries and Wildlife

Treating triazine-resistant kochia

Kochia and Russian thistle are summer annual weeds that germinate in early spring and are particularly troublesome in conservation tillage systems. Kochia and Russian thistle are normally readily controlled with Atrazine, Bladex, Lexone, and Sencor. However, in many areas of western and central Nebraska, kochia has developed resistance to triazine herbicides. Several control strategies can be used to control both susceptible and triazine-resistant kochia and Russian thistle.

In ridge-till or no-till corn, Banvel is an effective herbicide for Russian thistle and triazine resistant (TR) kochia control. Gramoxone Extra and Landmaster BW are effective on emerged kochia when applied before planting. Triazine-resistant kochia is more difficult to control than Russian thistle with 2,4-D.

For ridge-planted or no-till corn or sorghum, it's important to spray prior to planting while the weeds are small. Banvel at 1/2 pint per acre may be applied before, during or after planting corn on coarse, medium, and fine textured soils with less than 2% organic matter. Check with seed dealer for corn tolerance to Banvel for the hybrid selected. For sorghum, Banvel at 1/2 pint per acre may be applied 15 to 20 or more days prior to planting. In western Nebraska, use 20 days. Crop residue pushed aside during planting may protect weeds if sprayed after planting. Most problems with kochia in ridge-till occur when the planter openers do not cover kochia with soil at planting. Many ridge tillers set their planters to remove less ridge which reduces the effectiveness of weed control.

In fields where a seedbed is prepared for corn, use a tandem disk harrow or other tillage implement ahead of planting to kill emerged weeds. A mixture of Banvel at 1/2 to 3/4 pints per acre depending on soil texture and organic matter plus preemergence herbicides offers good kochia control in corn. Preemergence applications of Banvel at 3/4 or 1 pint per acre in corn can only be used on medium and fine textured soils with 2% or more organic matter.

A delayed planting can be used to your advantage, since additional kochia can emerge and be killed with tillage. However, corn yields may be reduced by planting later.

Several herbicides may be applied postemergence on corn and sorghum. The safest time to apply Banvel to corn is from the spike to five-leaf stage. Banvel may be applied when the sorghum is in the three to five leaf stage. In corn 8 to 36 inches tall use drop nozzles and direct spray solution to the lower half of the plant. Do not use Banvel within 1/2 mile of sugarbeet, field bean, alfalfa, soybean, gardens, and ornamentals. Do not use Banvel between June 20 and Sept. 1.

Marksman at 2 pints per acre for kochia less than 2 inches tall or 3 pints per acre for kochia less than 4 inches tall has been effective. Use Buctril/atrazine at 2 pints per acre on kochia less than 2 inches tall and 3 pints per acre on kochia less than 4 inches tall. Banvel at 1/4 pint per acre added to the Buctril/atrazine mix will help control taller kochia.

Tough sold by Sandoz, is very effective on triazine-resistant kochia at 1 quart per acre. At this rate the price is around $13/acre. Using Tough at 1 pt per acre plus atrazine has controlled small kochia less than 1 inch. Tough controls some broadleaf weeds while the atrazine controls most broadleaf weeds missed by Tough and provides some grass control. Buctril can be applied before planting up until corn or grain sorghum emergence to control actively growing weed seedlings. It also may be used postemergence on grain sorghum in the three-leaf stage to tassel emergence. Banvel plus Buctril probably gives the most consistent control.

Triazine-resistant kochia can be controlled in ridge planted or no-till soybean with Roundup at 1 pt per acre plus Pursuit, Pursuit Plus, Command, Canopy, or Gemini prior to crop emergence. These treatments should be applied 7 to 30 days before planting depending upon the size of the kochia. Gramoxone Extra does not work with these herbicides. Command applied preemergence or preplant incorporated will control kochia in soybeans. Soil applied treatments effective against Russian thistle include Sonalan, Treflan, Sencor, Lexone, Scepter, Preview, and Pursuit.

Postemergence herbicides that are effective on triazine-resistant kochia on tilled ground include Pursuit, Classic, Classic + Pinnacle, and Basagran 1 GPA 28% UAN. Kochia must be sprayed when less than 2 inches tall. Herbicides should be applied within 30 days of planting.

Gail Wicks, Bob Klein and Alex Martin, Extension Weeds Specialists

If you use Email and are looking for a timely way to report or ask questions about what you're finding in the field, check out the *CropWatch* listserver (*access information is in issue 96-1*). If you enjoy cruising the World Wide Web, check out the *CropWatch* home page at ianrwww.unl.edu/ianr/pubs/crpwatch/crpwatch.htm. For more information about many *CropWatch* topics, check out Extension Publications on the Web at ianrwww\\unl.edu/ianr/pubs/extnpubs.htm.